7586

Medium-Mu Triode

NUVISTOR TYPE

ALL-CERAMIC-AND-METAL CONSTRUCTION

Designed to Withstand Severe Mechanical Shock and Vibration in Industrial Applications, the 7586 is a General-Purpose Tube for Use in Amplifier and Oscillator Service at Frequencies Extending into the UHF Region.

Electrical: ←

Heater Characteristics and Ratings:

Voltage (AC or DC)	6.3 ± 0.6	volts
Current at heater volts = 6.3	0.135	amp
Peak heater-cathode voltage:		
Heater negative with respect to cathode	100 max.	volts
Heater positive with respect to cathode	100 max.	volts

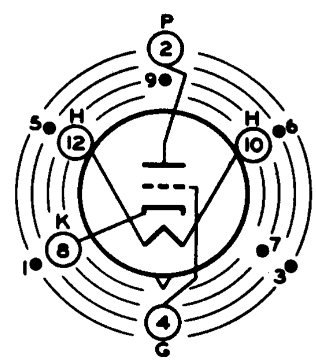
Direct Interelectrode Capacitances (Approx.):

Grid to plate	2.2	pf
Input: G to (K,S,H)	4.2	pf
Output: P to (K,S,H)	1.6	pf
Cathode to plate	0.26	pf
Heater to cathode	1.4	pf

Mechanical:

Operating Position	Any
Type of Cathode	Coated Unipotential
Maximum Overall Length	0.800"
Maximum Seated Length	0.625"
Maximum Diameter	0.440"
Weight (Approx.)	1.9 grams
Envelope	Metal Shell MT4
Socket	See *Socket & Connector Information for RCA Nuvistor Tubes* at front of this Section
Base	Medium Ceramic-Wafer Twelvar 5-Pin (JEDEC No.E5-65)
Basing Designation for BOTTOM VIEW	12AQ

Pin 1[a] - Do Not Use
Pin 2 - Plate
Pin 3[a] - Do Not Use
Pin 4 - Grid
Pin 5[a] - Do Not Use
Pin 6[a] - Do Not Use
Pin 7[a] - Do Not Use
Pin 8 - Cathode
Pin 9[a] - Do Not Use
Pin 10 - Heater
Pin 12 - Heater



INDEX = LARGE LUG
● = SHORT PIN; IC—DO NOT USE

Characteristics, Class A_1 Amplifier: ←

Plate Supply Voltage	–	–	75	volts
Plate Voltage	26.5	40	–	volts

← Indicates a change.

Grid Supply Voltage	0	0	0	volts
Cathode Resistor	–	–	100	ohms
Amplification Factor	31	35	35	
Grid Resistor	0.5	0.5	–	megohm
Plate Resistance (Approx.)	4400	3000	3000	ohms
Transconductance	7000	11500	11500	μmhos
Plate Current	2.8	7.5	10.5	ma
Grid Voltage (Approx.) for plate μa = 10	–	–	-7	volts

INDUSTRIAL SERVICE

Maximum Ratings, *Absolute-Maximum Values:*

For operation at any altitude

Plate Supply Voltage	330	volts
Plate Voltage	110	volts
Grid Voltage:		
Negative-bias value	55	volts
Peak-positive value	4	volts
Grid Current	2	ma
Cathode Current	15	ma
Plate Dissipation	1	watt

Maximum Circuit Values:

Grid-Circuit Resistance:[b]		
For fixed-bias operation	0.5	megohm
For cathode-bias operation	1	megohm

[a] Pin is cut off close to ceramic wafer.

→ [b] For operation at metal-shell temperature of 150° C. For operation at other metal-shell temperatures, see *Grid-Circuit Resistance Rating Chart*. Metal-shell temperatures are measured in Zone "A" (See accompanying *Dimensional Outline).*

CHARACTERISTICS RANGE VALUES

	Note	*Min.*	*Max.*	
Heater Current	1	0.125	0.145	amp
Direct Interelectrode Capacitances:				
Grid to plate	2	1.8	2.6	pf
Input: G to (K,S,H)	2	3.8	4.6	pf
Output: P to (K,S,H)	2	1.4	1.8	pf
Heater to cathode	2	1.1	1.7	pf
Cathode to plate	2	0.20	0.32	pf
Plate Current (1)	1,3	9	12.5	ma
Plate Current (2)	1,4	–	50	μa
Transconductance (1)	1,3	10000	13000	μmhos
Transconductance (2)	3,5	9000	–	μmhos
Transconductance Change: Difference between Transconductance (1) and Transconductance (2), expressed in per cent of Transconductance (1)	–	–	15	%
Reverse Grid Current	1,6	–	0.1	μa
→ Amplification Factor	1,3	28	42	

→ Indicates a change.

	Note	Min.	Max.	Units
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode.	1,7	-	5	µa
Heater positive with respect to cathode.	1,7	-	5	µa
Leakage Resistance:				
Between grid and all other electrodes tied together.	1,8	1000	-	megohms
Between plate and all other electrodes tied together.	1,9	1000	-	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: Measured in accordance with EIA Standard RS-191-A.

Note 3: With dc plate supply volts = 75, dc grid supply volts = 0, cathode resistor = 100 ohms, cathode-bypass capacitor = 1000µf, and metal shell connected to ground. ◄

Note 4: With dc plate volts = 75, dc grid volts = -7, and metal shell connected to ground.

Note 5: With 5.7 volts ac or dc on heater.

Note 6: With dc plate volts = 80, grid supply volts = -1.2, grid resistor = 0.5 megohm, and metal shell connected to ground.

Note 7: With 100 volts dc applied between heater and cathode.

Note 8: With grid 100 volts negative with respect to all other electrodes tied together, and metal shell connected to ground. ◄

Note 9: With plate 300 volts negative with respect to all other electrodes tied together, and metal shell connected to ground. ◄

SPECIAL RATINGS & PERFORMANCE DATA ◄

Shock Rating:

Peak Impact Acceleration. . . . . 1000 g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified Peak Impact Acceleration. Tubes are held rigid in four different positions (X_1, X_2, Y_1, Y_2) in a Navy Type, High-impact (flyweight) Shock Machine, and with tube electrodes applied, are subjected to 20 blows (5 in each position) at the specified Peak Impact Acceleration. At the end of this test, tubes are criticized for change in transconductance, reverse grid current, and heater-cathode leakage current, and are then subjected to the Variable-Frequency Vibration Test described below.

Fatigue Rating:

Peak Vibrational Acceleration. . . . . 2.5 max. g

This test is performed on a sample lot of tubes to determine ability of tube to withstand the specified Peak Vibrational Acceleration. Tubes are rigidly mounted, supplied with center heater voltage only, and subjected for 48 hours to 2.5-g Peak Vibrational Acceleration at 60 cycles per second in the X_1 position. At the end of this test, tubes are criticized for the same characteristics and end-point values as in the Shock Rating Test described above.

Variable-Frequency Vibration Performance:

This test is performed on a sample lot of tubes from each production run. The tube is operated under the conditions specified in CHARACTERISTICS RANGE VALUES for Transconductance (1) with the addition of a plate-load resistor of 2000 ohms.

◄ Indicates a change.

During operation, tube is vibrated in the X_1 position through the frequency range from 50 to 15,000 cycles per second with a constant vibrational acceleration of 1g. During the test, tube must not show an rms output voltage across the plate-load resistor in excess of:

25 millivolts over the frequency range of 3000 to 6000 cps
500 millivolts over the frequency range of 6000 to 15000 cps

Post-Impact and Post-Fatigue Vibration Limits:

35 millivolts over the frequency range of 3000 to 6000 cps
700 millivolts over the frequency range of 6000 to 15000 cps

Low-Pressure Voltage-Breakdown Test:

This test is performed on a sample lot of tubes to determine the ability of the tube to withstand high-altitude (low-air-pressure) conditions. Tubes are operated with 250 rms volts applied between plate and all other electrodes and metal shell connected together and will not break down or show evidence of corona when subjected to air pressures equivalent to altitudes of up to 100,000 feet (8.0 ± 0.5 mm Hg.)

Heater Cycling:

Cycles of Intermittent Operation. . . . . . 2000 cycles

This test is performed on a sample lot of tubes from each production run under the following conditions: heater volts= 8.5 cycled one minute on and two minutes off; heater 180 volts negative with respect to cathode; grid, plate, and metal shell connected to ground. At the end of this test, tubes are tested for open heaters and heater-cathode shorts, open cathode circuits, and heater-cathode leakage currents.

Shorts and Continuity:

This test is performed on a sample lot of tubes from each production run. Tubes are subjected to the Thyratron-Type Shorts Test described in MIL-E-1D, Amendment 2, Paragraph 4.7.7, except that tapping is done by hand with a soft rubber tapper[c]. See accompanying Shorts-Test Acceptance-Limits curve. Tubes are criticized for permanent or temporary shorts and open circuits.

Early-Hour Stability Life Performance (20 hours):

This test is performed on a sample lot of tubes from each production run to insure that tubes are properly stabilized. Tubes are operated at center heater voltage for 20 hours at maximum-rated plate dissipation. After 2 hours of operation and again after 20 hours of operation, tubes are checked for transconductance under the conditions specified in CHARACTERISTICS RANGE VALUES for Transconductance (1). A tube is rejected if its transconductance after 2 or 20 hours of operation has changed more than 10 per cent from the 0-hour value.

Survival-Rate Life (100 hours):

This test is performed on a sample lot of tubes from each production run to assure a minimum of early-hour inoperatives. Tubes are operated with center heater voltage cycled 100 minutes on and 20 minutes off for 100 hours at maximum-rated plate

[c] Specification for tapper supplied on request.

dissipation, and then subjected to the Shorts and Continuity Test Transconductance (I), and Reverse Grid Current. Tubes must then show a transconductance of not less than 8300 micromhos and reverse grid current no greater than 0.2 microampere.

Intermittent Conduction Life (1000 hours):

This test is performed on a sample lot of tubes from each production run to assure the high quality of individual tubes and to prevent epidemic failures due to excessive changes in tube characteristics. Tubes are operated with center heater voltage cycled 110 minutes on and 10 minutes off, and maximum rated plate dissipation, at a shell temperature of 150° C.

Tubes are criticized at 500 and 1000 hours for Inoperatives,[d] reverse grid current, heater-cathode leakage current, and leakage resistance. In addition, a tube is rejected if its Transconductance (I) after 500 hours has changed more than 20 per cent or after 1000 hours has changed more than 25 per cent from the 0-hour value. The average change in Transconductance (I) of the lot from the 0-hour value must not exceed 15 per cent at 500 hours and 20 per cent at 1000 hours.

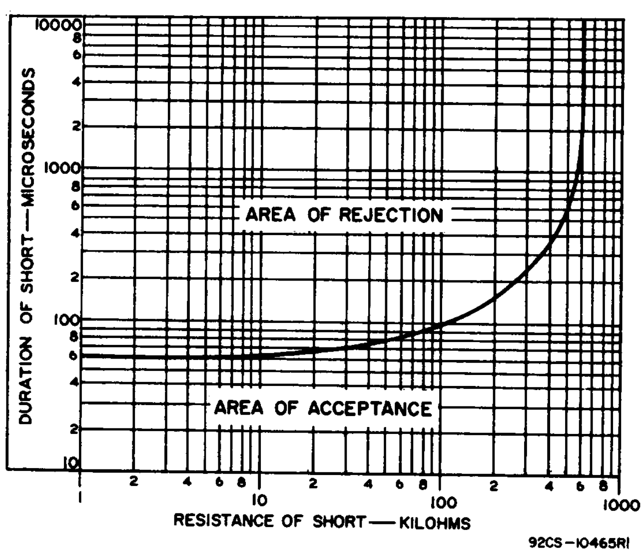
Standby Life (1000 hours):

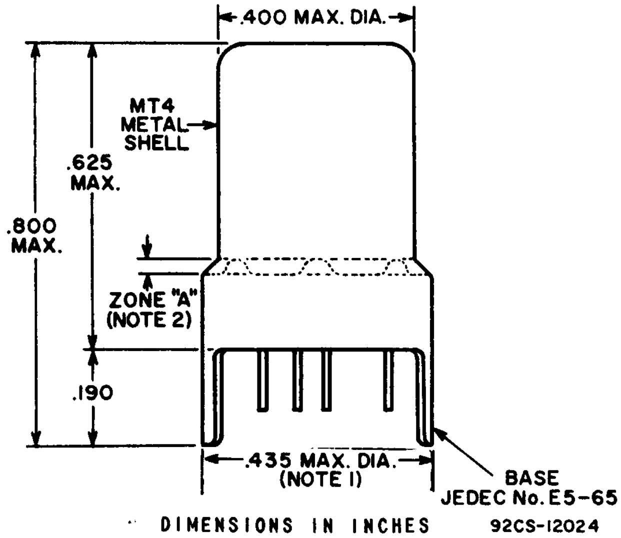
This test is performed on a sample lot of tubes from each production run. Tubes are operated with only the center heater voltage applied.

At 500 and 1000 hours the tubes are criticized for leakage resistance, reverse grid current, the change in Transconductance (I) of individual tubes from the 0-hour values, and for cathode interface resistance greater than 25 ohms. Interface resistance is measured by Method B of ASTM specification F300-61T.

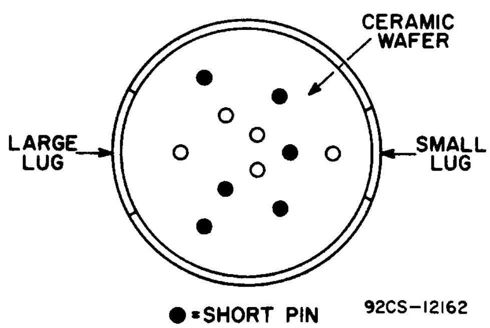
[d] An inoperative is defined as a tube having a discontinuity, permanent short, or air leak.

SHORTS-TEST ACCEPTANCE LIMITS

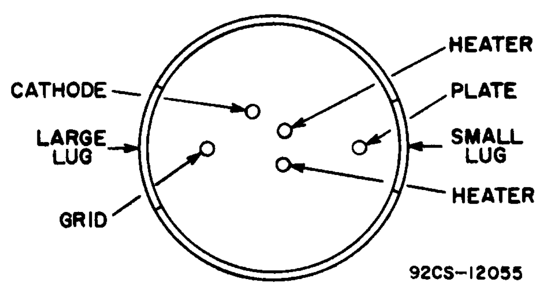




BOTTOM VIEW
Showing Arrangement of All 11 Base Pins



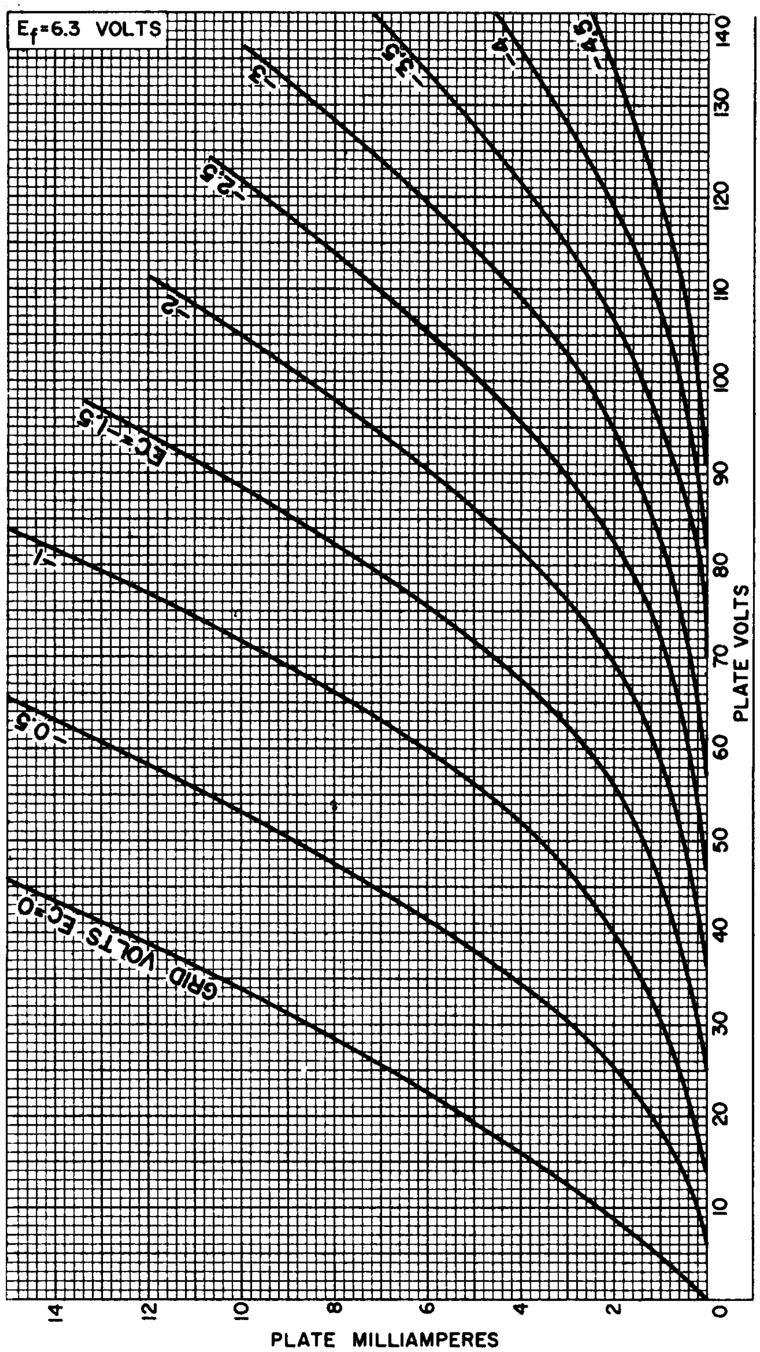
MODIFIED BOTTOM VIEW
With Element Connections Indicated
and Short Pins Not Shown



Note 1: Maximum outside diameter of 0.440" is permitted along 0.190" lug length.

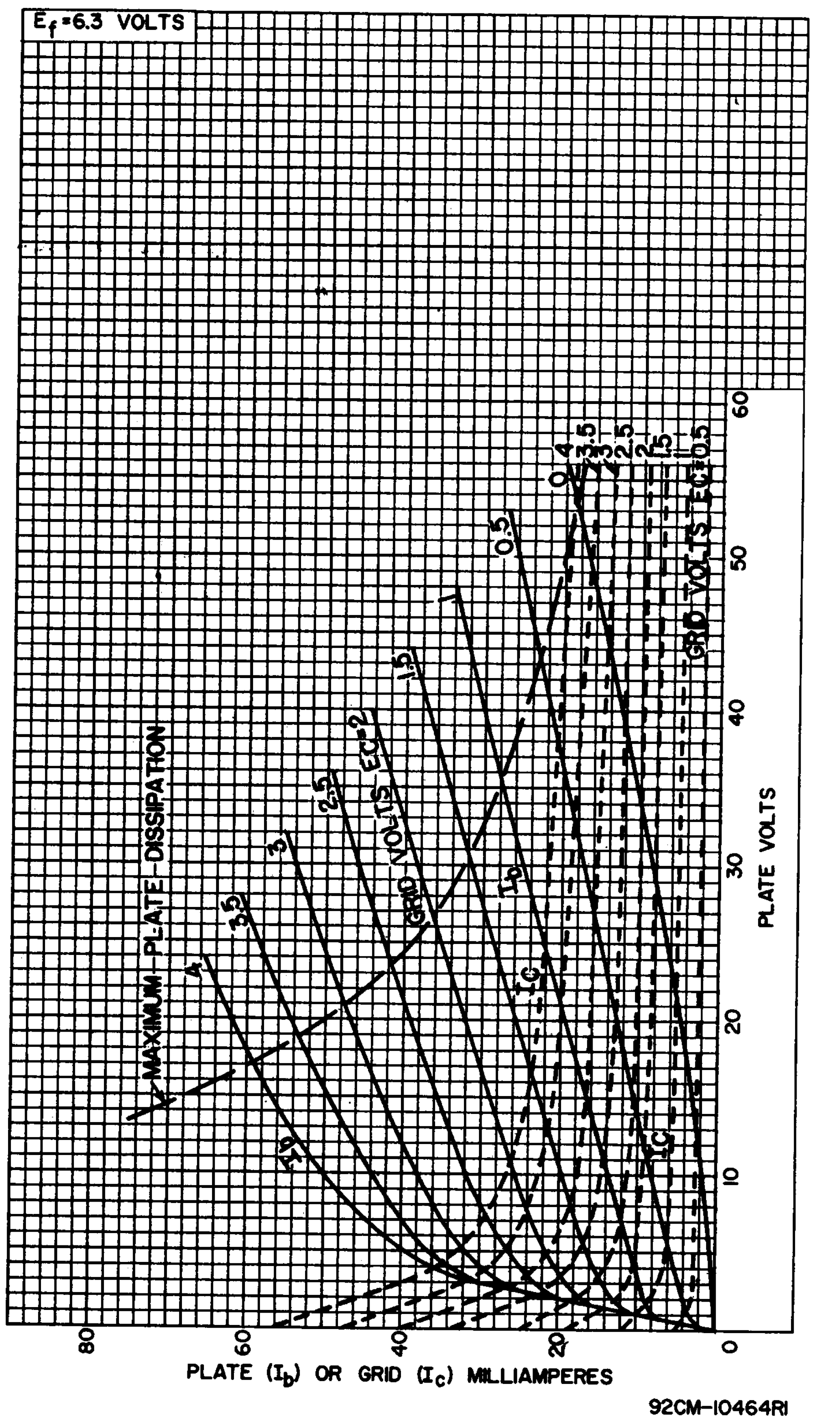
Note 2: Metal-shell temperature should be measured in Zone "A".

AVERAGE PLATE CHARACTERISTICS



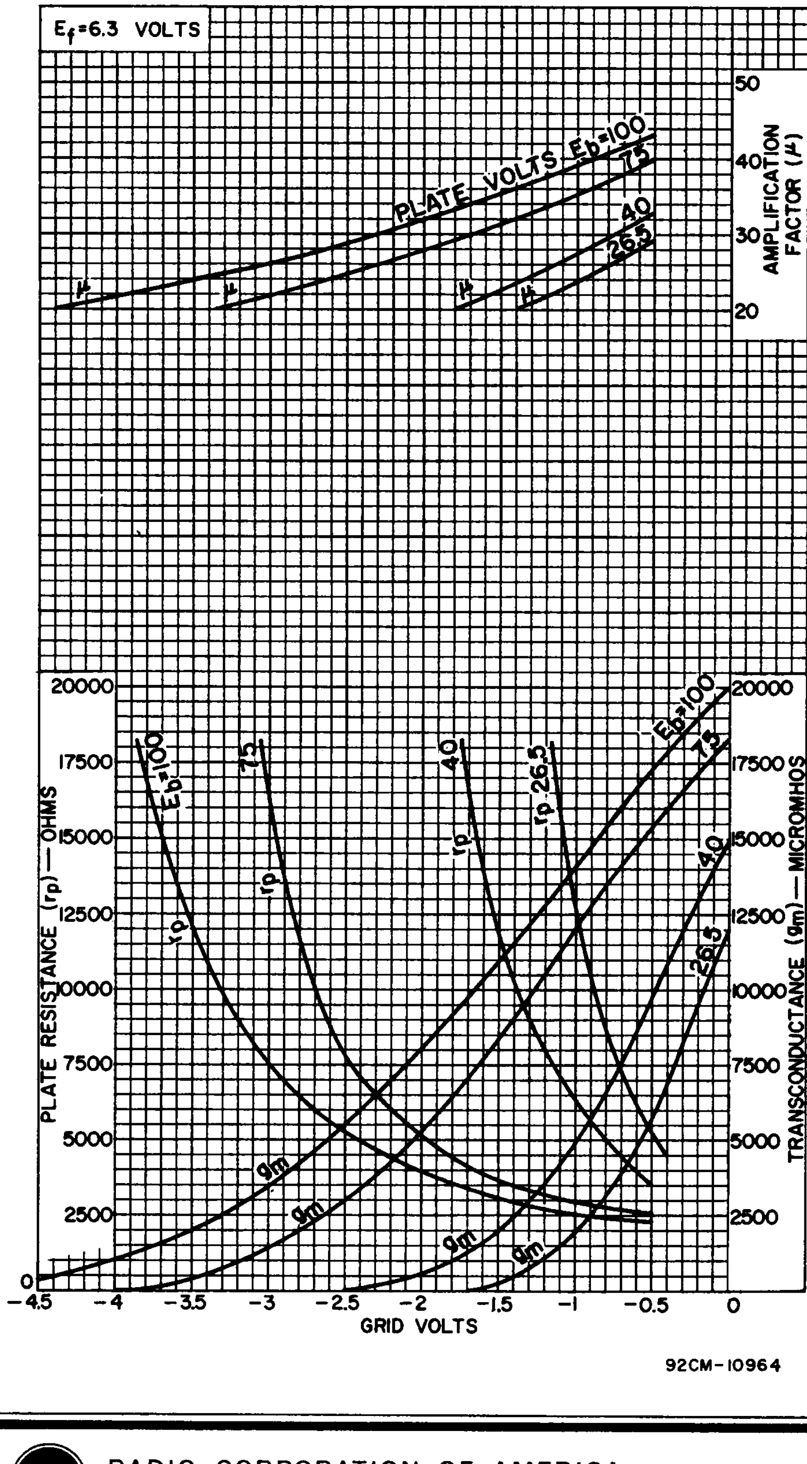
92CM-10460R2

AVERAGE CHARACTERISTICS

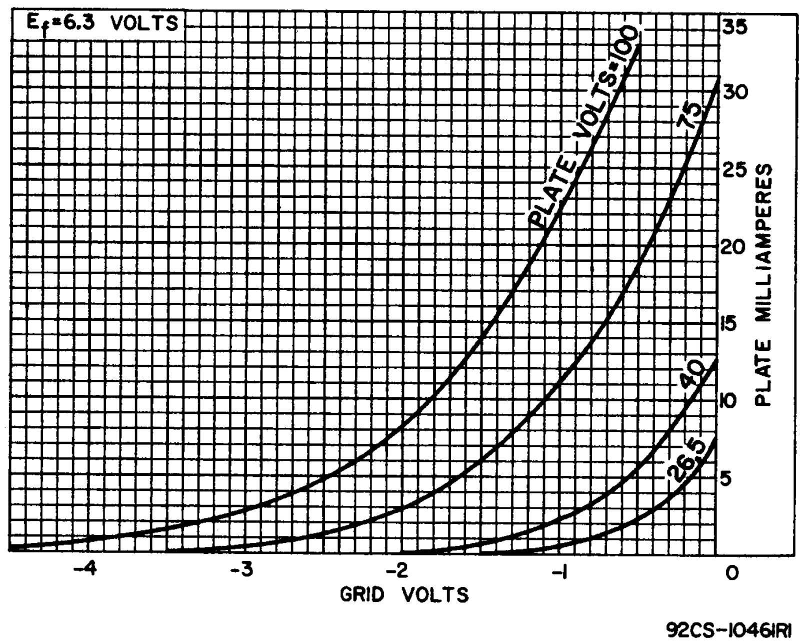


92CM-10464RI

AVERAGE CHARACTERISTICS



AVERAGE CHARACTERISTICS



GRID-CIRCUIT-RESISTANCE RATING CHART

